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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Simon Doclo

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CONNOLLY BOVE LODGE & HUTZ LLP

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SUITE 1100

WASHINGTON, DC 20006

EXAMINER

PAUL, DISLER

ART UNIT

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2615

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/564,182		DOCLO ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	DISLER PAUL		2615	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7,9-11 and 13-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7,9-11 and 13-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 1/27/06 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____.  | 6) <input type="checkbox"/> Other: ____.                          |

## DETAILED ACTION

### *Response to Amendment*

In regard to the applicant's amended claim limitation which states " having coefficients configured to minimize a weighted sum of the speech distortion energy and the residual noise energy in said output version of said speech signal, please see the appropriate claim rejections as set forth below.

1. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-2, 5-7, 9, 14-16, 19-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Yang et al. (US 7,206,418 B2).

Re claim 1, Yang et al. disclose of the method of reducing noise in a noisy speech signal, comprising: the steps of applying at least two versions of said noisy speech signal to a first filter, said first filter outputting a speech reference signal comprising a desired signal and a noise contribution (fig.2,3A; col.2 line 35-40, col.5 line 8-20/wt plurality of microphone to enable) and at least one noise reference signal comprising a speech leakage contribution and a noise contribution (fig.2,3B; col.5 line 25-37/mostly noise with some speech leakage), applying a filtering operation to each of said at least one noise reference signals, and subtracting from said speech reference signal of said filtered at least one noise reference signal to provide an output version of said speech signal having reduced noise therein (fig.4 wt (450,434); col.9 line 44-49; col.10 line 5-19), whereby said filtering operation of said at least one noise reference signal is

performed with one of more filters having filter coefficients configured to minimize a weighted sum of the speech distortion energy and the residual noise energy in said output version of said speech signal ( fig.4 wt (450); col.10 line 10-19; col. 9 line 50-60/output to minimize the noise between the speech predominant noise and noise mostly signal error).

Yang et al. further disclose of the operation of the noise reference signal (fig.4 wt (450)/most predominantly noise thus infer of speech being included) and further while, Yang et al. is silent in regard of the specific wherein said speech distortion energy being the energy of said speech leakage contributions and said residual noise energy being the energy of said noise contributions in said speech reference signal and in said at least one noise reference signal. But, Notice that Yang et al. disclose of the specific wherein having noise being included in both the reference signal with predominantly noise and some speech leakage and speech signal with noise distortion and minimizing the error with noise included for both the noise receive signal and estimated noise (col.10 line 1-1-; col.9 line 40-60). Thus, with the above disclosure it is inherent of such existence wherein said speech distortion energy being the energy of said speech leakage contributions and said residual noise energy being the energy of said noise contributions in said speech reference signal and in said at least one noise reference signal

Re claim 2, the of claim 1, wherein at least two microphones are provided , each said microphone configured to provide a version of said speech signal to said first filter I (fig.3B, col.5 line 22-27/plurality of microphones).

Re claim 5, the method of claim 1, further comprising the delaying said speech reference signal before performing said subtraction of said filtered at least one noise reference signal from said speech reference signal (fig.3A wt (214A); col.6 line 30-32/wt delaying included).

Re claim 6, the method of claim 1, further comprising: applying a filtering operation to said speech reference signal; and subtracting said filtered speech reference signal and said at least one noise reference signal from said speech reference signal to provide said output version of said speech reference signal (fig.4 wt (432,434)).

Re claim 7, the method of claim 1, further comprising: adapting said filter coefficients so to take into account one or more of said speech leakage contribution and said desired signal (fig.4 wt (450); col.10 line 11-18; col.9 line 44-47).

Re claim 9, Yang et al. disclose of the signal processor for reducing noise in a speech signal, comprising: a first filter configured to receive two versions of said speech signal, and to output a speech reference signal and at least one noise reference signal, wherein said speech reference signal comprises a desired signal and a noise contribution , and wherein said at least one noise reference signal comprises a speech leakage contribution and a noise contribution (fig.2-3 wt (214); col.2 line 35-40, col.5 line 8-20/speech signal with noise and noise signal with some speech leakage from plurality of microphones ), a second filter configured to filter said at least one noise reference signal (fig.4 wt (450); col.9 line 44-49; col.10 line 5-19), and a summer configured to subtract said at least one filtered noise reference signal and from said speech reference signal to provide an output version of said speech signal having reduced noise therein (fig.4 wt (434); col.9 line 35-45); and wherein said second filter has filter

coefficients configured to minimize a weighted sum of the energy of said speech leakage contribution and the energy of said contributions in said output version of said speech signal (fig.4 wt (450); col.10 line 10-19; col. 9 line 50-60/output to minimize the noise between the speech predominant noise and noise mostly signal error).

Re claim 14, the signal processor of claim 9, wherein said second filter is further configured to filter said speech reference signal, and wherein said summer is configured to subtract said filtered speech reference signal and said at least one filtered noise reference signal from said speech reference signal to provide said output version of said speech signal (fig.4 wt (434); col.9 line 35-45).

Re claim 15, the signal processor of claim 9, wherein said filter coefficients are adaptive so as to take in to account one or more of said speech leakage contribution and said desired signal (col.10 line 10-20/noise and speech error).

Re claim 16, 19-21 has been analyzed and rejected with respect to claims 9, 5-7.

3. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yang et al. (US 7,206,418 B2) and further in view of Marsh (US 6,178,248 B1).

Re claim 13, the signal processor of claim 9, However, Yang et al. fail to disclose of the signal processing circuit is implanted in a prosthetic hearing device. However, Marsh disclose of an adaptive & beamforming system wherein the signal processing circuit is implanted in a prosthetic hearing device (col.1 line 11-16; col.2 line 20-29) for the purpose of providing

improved intelligibility to the hearer and compensating for background noise. Thus, taking the combined teaching of Yang et al. and Marash as a whole, it would have been obvious for one of the ordinary skill in the art at the time of the invention to have modify Yang et al. by incorporating the adaptive & beamforming system wherein the signal processing circuit is implanted in a prosthetic hearing device for the purpose of providing improved intelligibility to the hearer and compensating for background noise.

4. Claim 3-4, 10-11, 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang et al. (US 7,206,418 B2) and further in view of Hoshuyama (US 6,449,586 B1).

Re claim 3, the method of claim 1, wherein said first filter is a spatial pre-processor filter comprising: a beamformer filter and a blocking filter (fig.2 wt (214a, 214b)), However, Yang et al. fail to disclose of the specific wherein the blocking filter being the specific of the blocking matrix filter. However, Hoshuyama disclose of a beamforming adaptive enhancing signal wherein the blocking filter being the specific of the blocking matrix filter (fig.24-27,35; col.5 line 62-65) for the purpose of processing group of signals. thus, taking the combined teaching of Yang et al. and Hoshuyama as a whole, it would have been obvious for one of the ordinary skill in the art at the time of the invention to have modify Yang et al. by incorporating the beamforming adaptive enhancing signal wherein the blocking filter being the specific of the blocking matrix filter for the purpose of processing group of signals.



Re claim 4, the method of claim 3, wherein said speech reference signal is output by said beamformer filter; and wherein said at least one noise reference signal is output by said blocking matrix filter (col.5 line 8-39).

Re claim 10, the signal processor of claim 9, wherein said first filter is a spatial pre-processor filter, comprising a beamformer filter and a blocking filter (fig.2 wt (214a,214b)) , However, Yang et al. fail to disclose of the specific wherein the blocking filter being the specific of the blocking matrix filter. However, Hoshuyama disclose of a beamforming adaptive enhancing signal wherein the blocking filter being the specific of the blocking matrix filter (fig.24-27,35; col.5 line 62-65) for the purpose of processing group of signals. thus, taking the combined teaching of Yang et al. and Hoshuyama as a whole, it would have been obvious for one of the ordinary skill in the art at the time of the invention to have modify Yang et al. by incorporating the beamforming adaptive enhancing signal wherein the blocking filter being the specific of the blocking matrix filter for the purpose of processing group of signals.

Re claim 11, the signal processor of claim 10, wherein said beamformer filter is a delay-and-sum beamformer (fig.3A).

Re claims 17-18 have been analyzed and rejected with respect to claims 3-4.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Disler Paul whose telephone number is 571-270-1187. The examiner can normally be reached on 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. P./  
Examiner, Art Unit 2615

/Vivian Chin/  
Supervisory Patent Examiner, Art Unit 2615